



# COMMON HAND INJURIES

Dr. Abdullah Kattan FRCS(C)  
Assistant Professor KSU  
Consultant Plastic &  
Reconstructive Surgeon

# History

- ▣ 5 Important Questions
  - Hand dominance
  - Occupations
  - Previous hand trauma or injury
  - Smoking
  - Tetanus
- ▣ Acute or Chronic
- ▣ Mechanism of injury, and complaint
  - Trauma, Laceration, Swelling or lump, Arterial or Venous injury, Dislocation, Infection, Numbness

# Examinations

- ▣ Look
  - Compare both hands
  - Dorsum then volar surface
    - ▣ Skin ( Ulcers or lesions )
    - ▣ Swelling
    - ▣ Wasting
    - ▣ Position
- ▣ Feel Tenderness, sensation, temperature, Cap refill
- ▣ Move Range of Motion
  - Passive, Active
  - Examine FDS, FDP, & extensor tendons

# Examinations

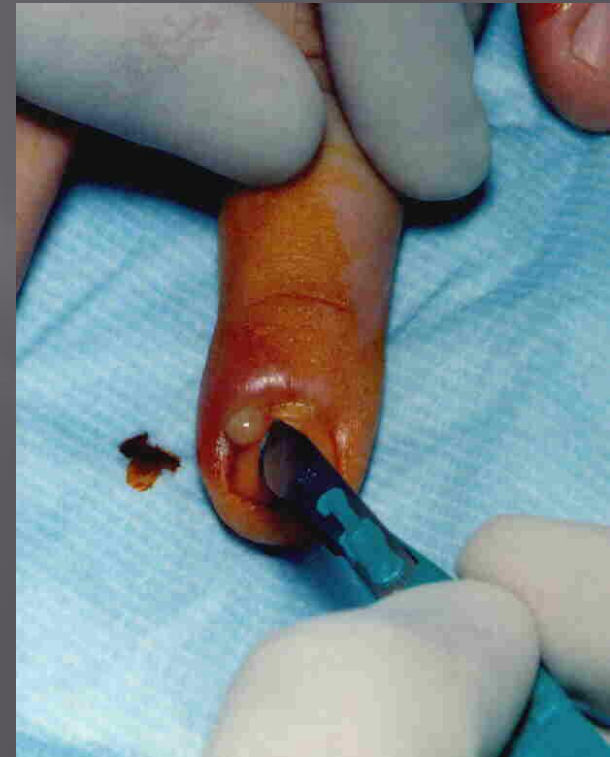
- ▣ Test Specific Nerves (Motor and Sensory)
  - Median
  - Ulnar
  - Radial

# Hand Infections

- ▣ *Paronychia* infection due to *Staph aureus*
  - Rx Abx, soaking
  - I&D



- ▣ *Felon*
  - Infection of the finger pulp



# Hand Infections

## ▣ *Herpetic Whitlow*

- HSV vesicular eruption of the fingertip

## ▣ *Collar Abscess*

- Abscess of the hand web-Space





# Hand Infections

## ▣ *Flexor Tenosynovitis*

### ■ 4 Sings :

- ▣ Sausage shape
- ▣ Flexed position
- ▣ Pain with passive extension
- ▣ Tenderness along the tendon sheath

### ■ Rx :

- ▣ Abx
- ▣ I&D
- ▣ Catheter irrigation



# Hand Infections

## ▣ *Hand Bites*

- Human : Staph, Strep, Eikenella
- Dog : Pasteurella Multocida, Staph, Strep
- Cat : Pasteurella Multocida
- Rx :
  - ▣ Abx
  - ▣ If no Response I&D





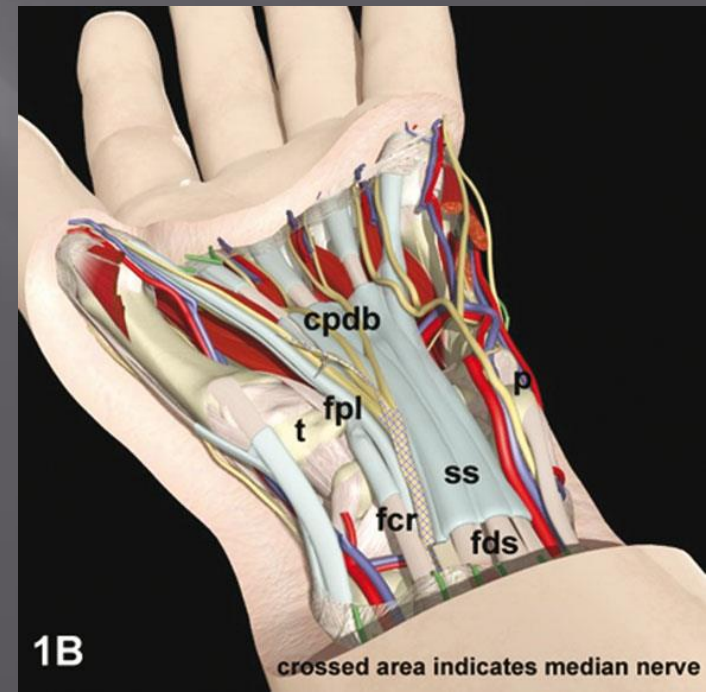
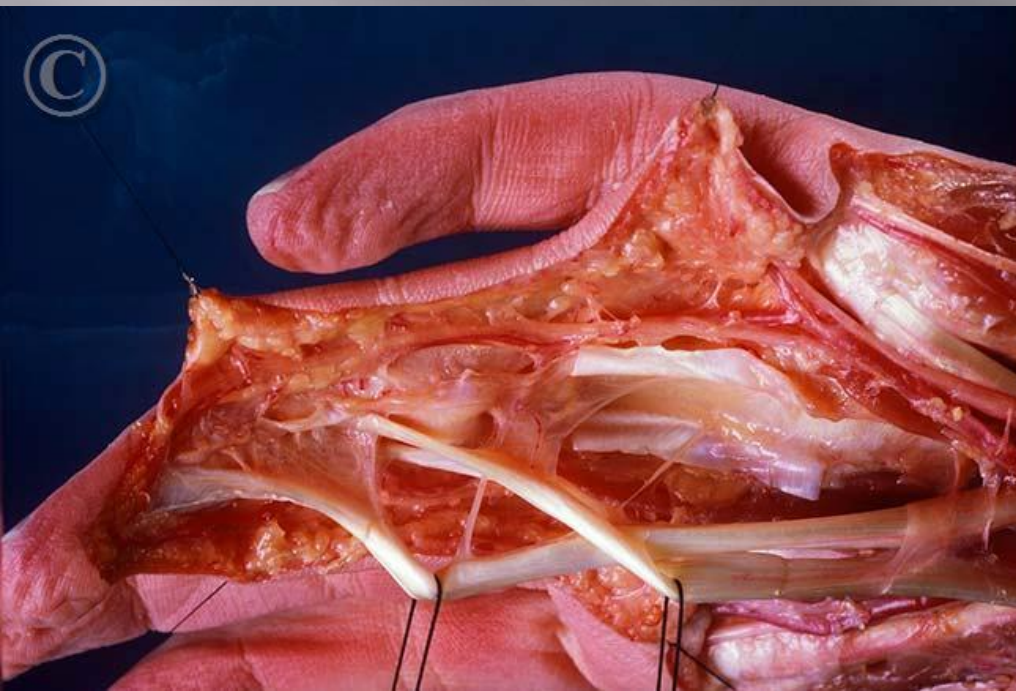
# Necrotizing Fasciitis

- ▣ Flesh eating disease of the soft tissue
- ▣ Caused by Group A *Beta* hemolytic strep
- ▣ Has high mortality rate
- ▣ Need extensive debridement and IV Abx



# Flexor Tendons Anatomy

- ▣ There is 8 muscles with almost 12 tendons in the flexor side, (4FDS, 4FDP, FPL FCU, FCR, PL)
- ▣ Origin, Insertion, Nerve Supply



# Flexor Tendons

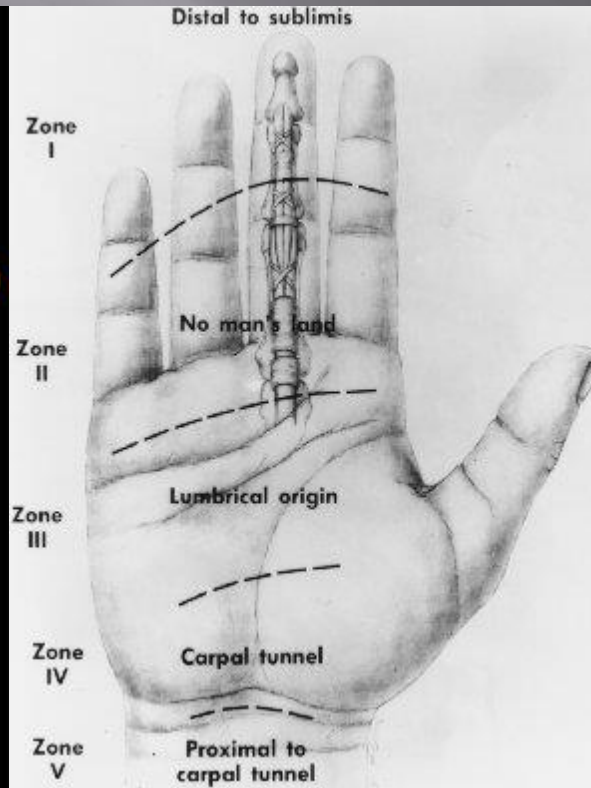
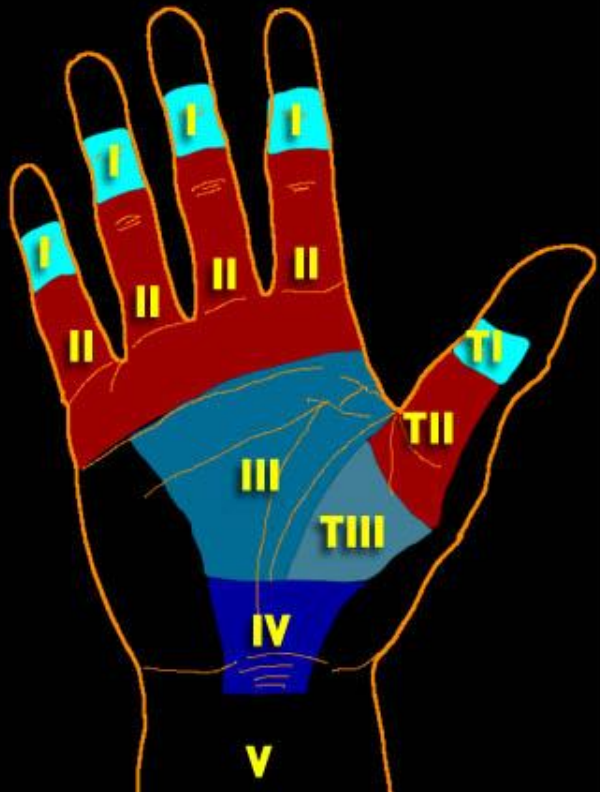
## Mechanism of Injury

- ▣ Closed Vs. Open
- ▣ Open
  - Knife is the most common tool for the injury
  - Crush injury
  - Degloving injury



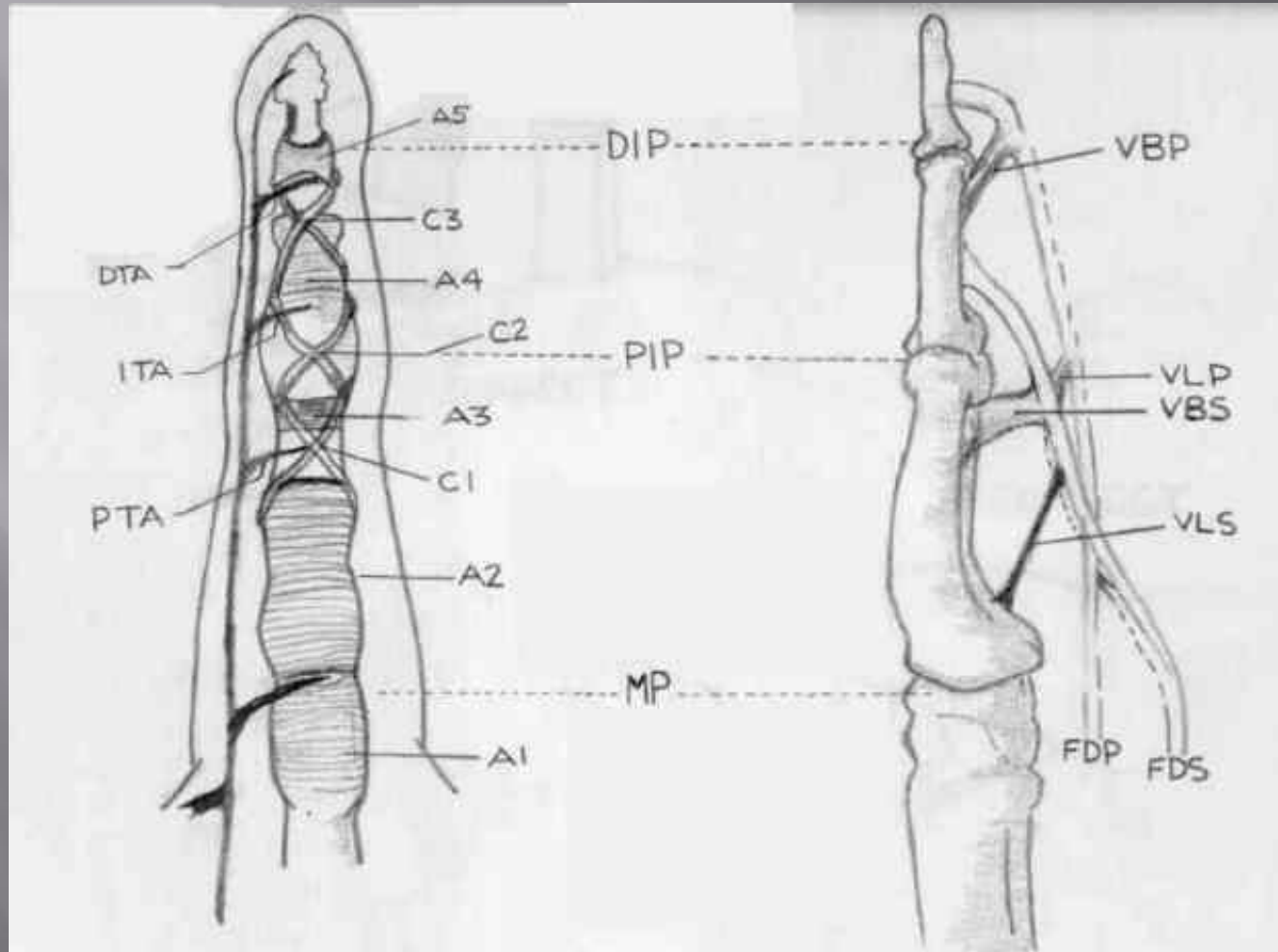
# Flexor Tendons Zones

## ▣ Verdan's 5 Zones



# Flexor Tendons

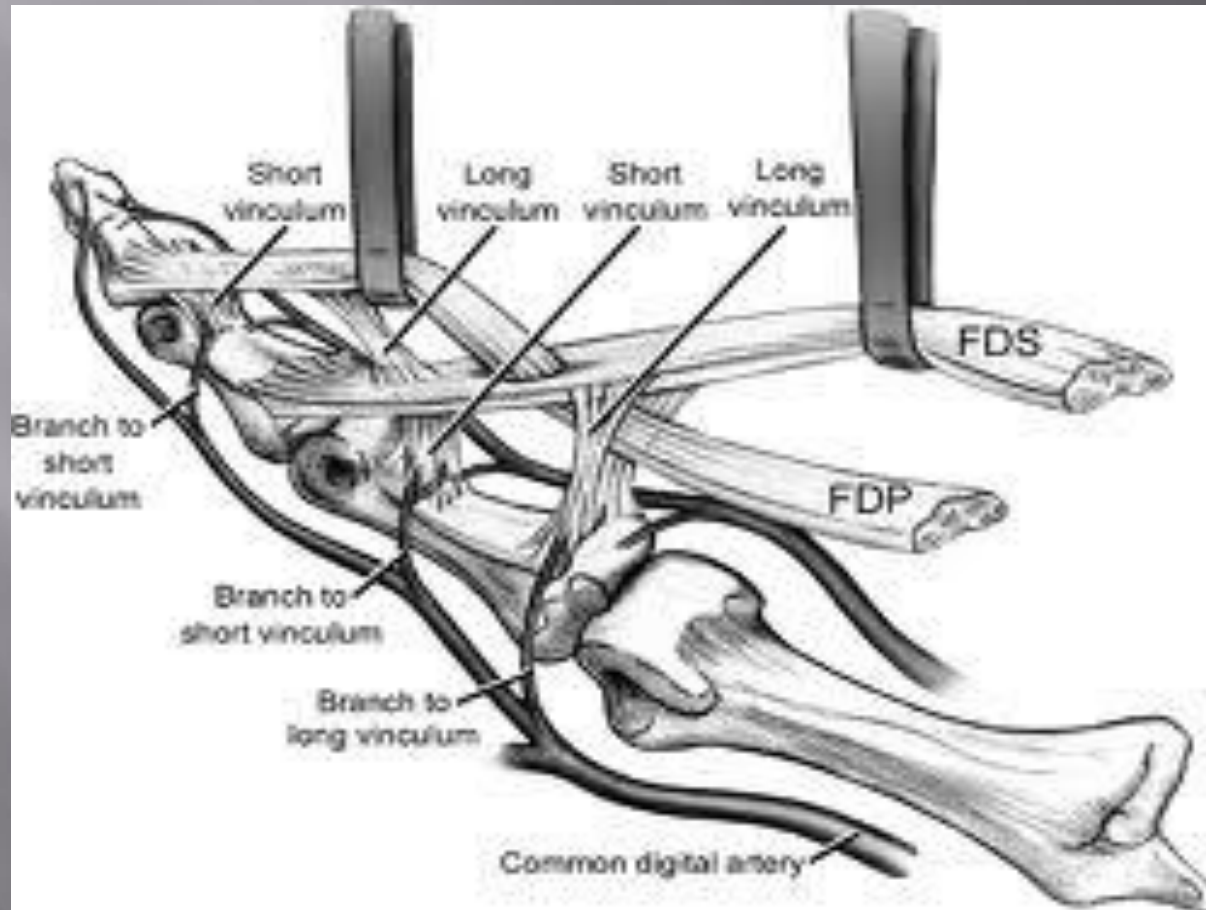
## Pulley System and Tendon Blood Supply





# Flexor Tendons

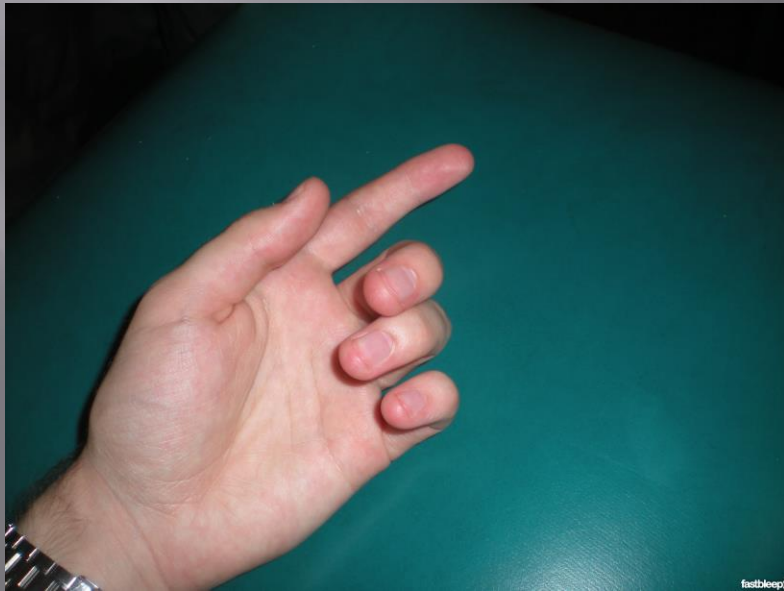
## Pulley System and Tendon Blood Supply



# Flexor Tendons

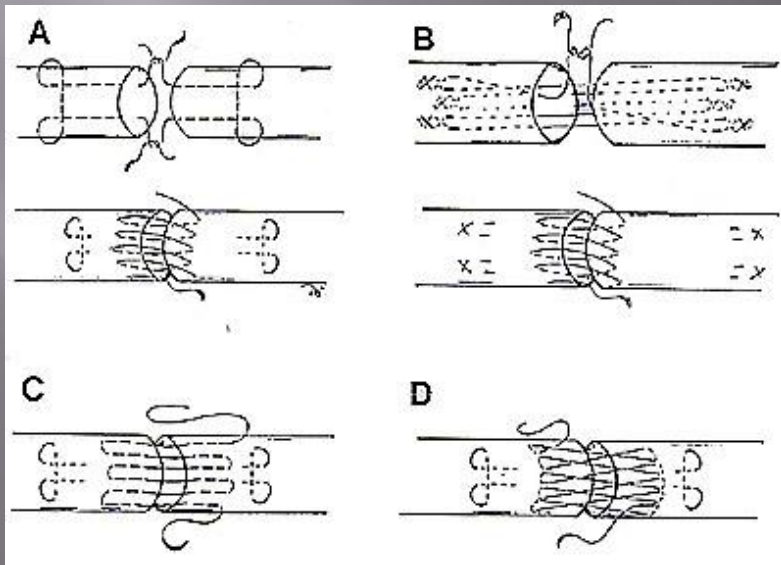
## Clinical Examination & Finding

- ▣ Loss of flexion cascade
- ▣ Open wound most commonly
- ▣ Tendon could be visible in the wound
- ▣ Inability to flex the digit at PIP or DIP

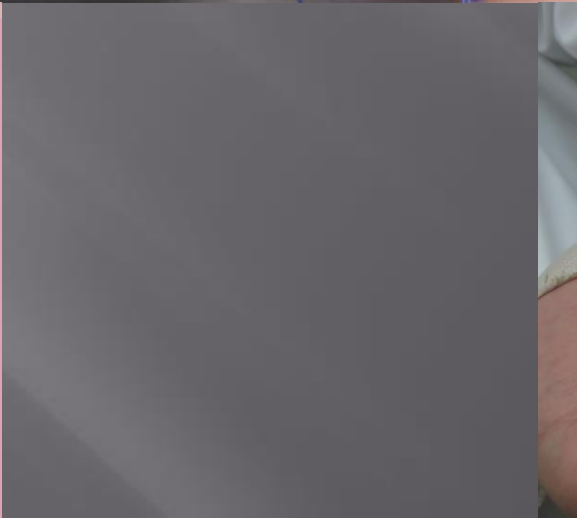
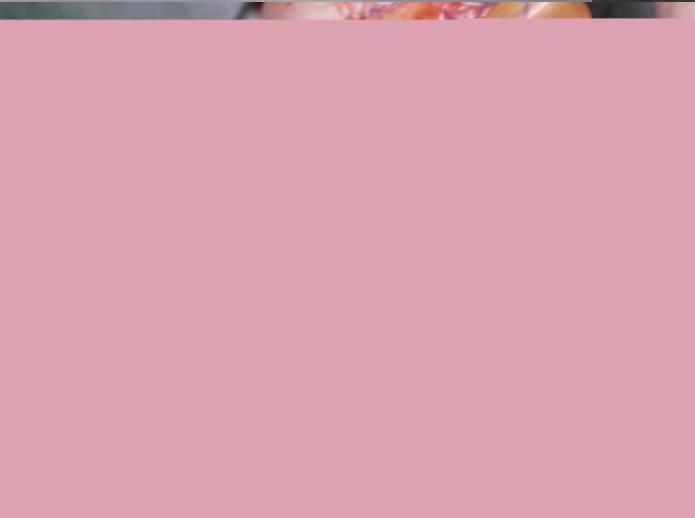
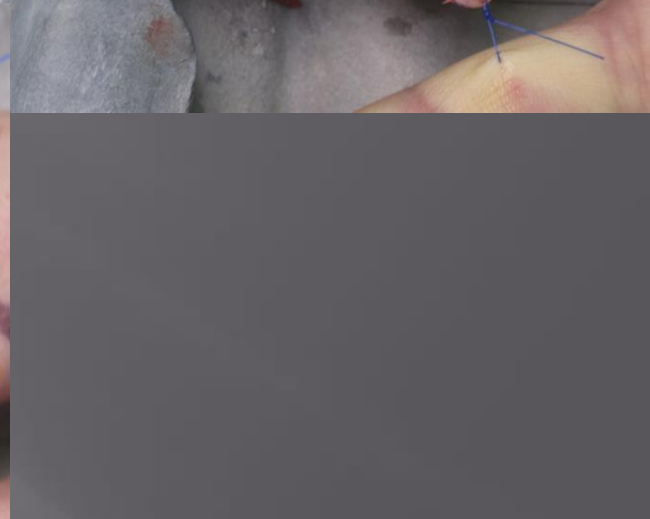


# Flexor Tendons Repair

- ▣ Explore the wound in zigzag fashion
- ▣ Find the 2 ends of the cut tendon
- ▣ Repair : > 25 different technique for the repair
- ▣ Non absorbable suture







# Flexor Tendons Splints





# Replantation

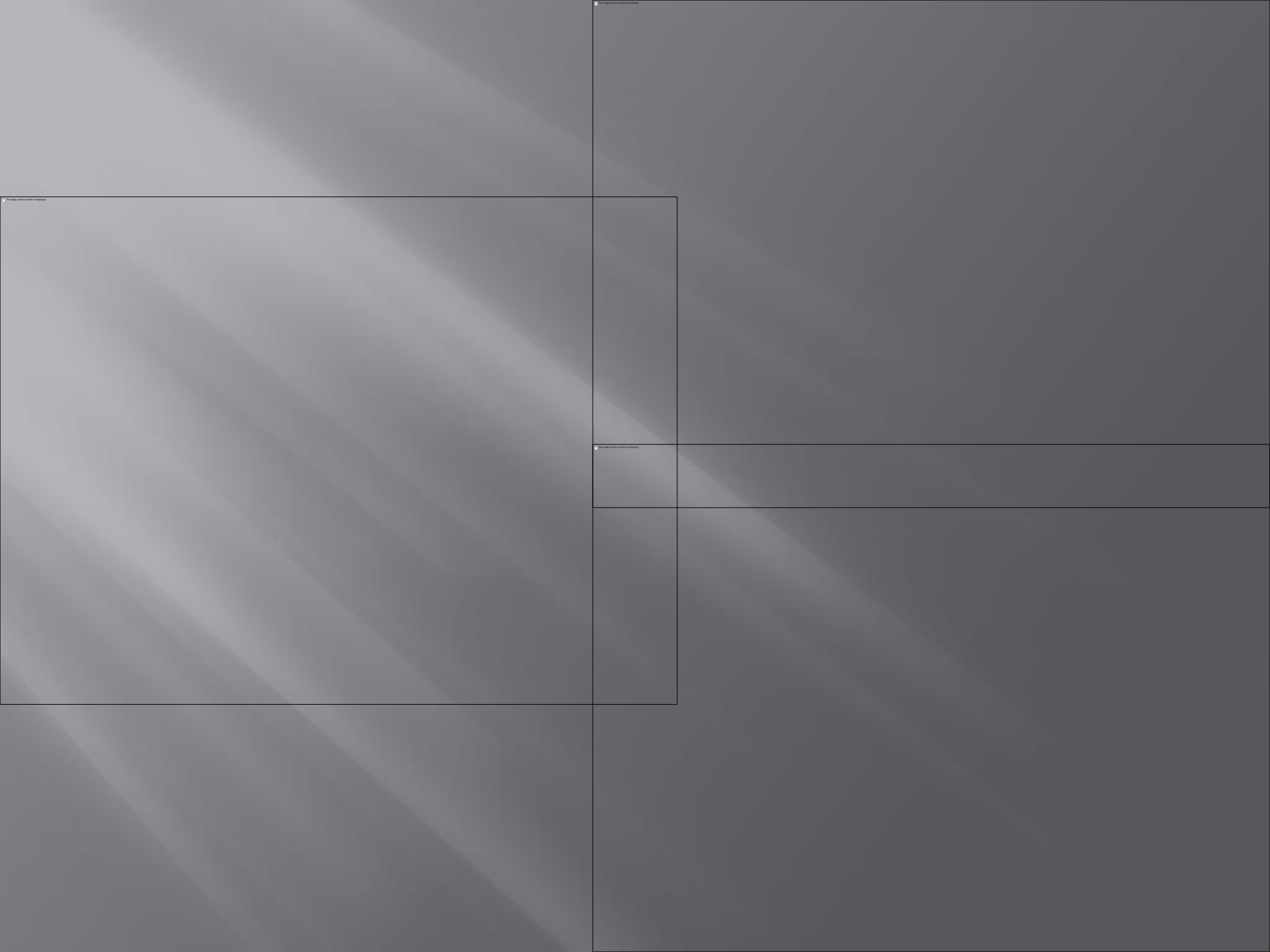
## Indication & Contraindication

### ▣ Indications

- Amputated Thumb
- Children
- Multiple digits
- Partial or whole hand

### ▣ Contraindications

- Life threatening injury
- Sever chronic illness
- Multilevel injury
- Severly crushed injury
- Single digit
- Sever contamination
- Avulsion injury



# Replantation

## General Principles

- ▣ Resuscitate the patient
- ▣ Keep amputated part in moist gauze in a bag on ice
- ▣ X-ray the hand and the amputated part
- ▣ Consent for vein, nerve, tendon, skin graft
- ▣ Prepare the amputated part
- ▣ Shorten the bone
- ▣ Arthrodesis
- ▣ Repair flexor and extensor tendon
- ▣ Repair Digital artery vein and nerve
- ▣ Skin closure +/- skin graft

# Replantation Complication

## ▣ White finger

- Ensure pt is warm
- Full with fluid
- Prevent hypotension
- Loosen dressing
- Remove sutures
- Re-Explore

## ▣ Blue finger

- Elevate limb
- Loosen dressing
- Remove sutures
- Leeches
- Remove nail
- Heparin injections
- Re-Explore

# Leeches





# Hand Fractures

- ▣ Unstable fracture
  - Cannot be reduced closed or cannot be held reduced without fixation
- ▣ Antibiotics
  - 30% risk of infection in open fracture including open Distal Phalanx fracture
  - Reduce to 3% with antibiotics
- ▣ The distal phalanx fracture with subungual haematoma should be considered open
- ▣ Healing 4/52's for phalangeal fracture 5-6/52's for metacarpal fracture

# Hand Fractures

- ▣ Acceptable hand fractures
  - Tuft distal phalanx
  - AP displaced metaphyseal fracture in children
  - MC neck fracture
    - ▣ <15 in index and middle finger
    - ▣ <30-40 in ring and little finger
  - MC base fracture
    - ▣ Adult < 20
    - ▣ Children < 40

# Hand Fracture

- ▣ Unacceptable phalangeal fractures
  - Rotational angulation
  - Sever dorsal angulation
  - Lateral angulation



# Pediatric Hand Fractures

## Solter harris Classifications

- ▣ Type I – A transverse fracture through the growth plate 6%
- ▣ Type II – A fracture through the growth plate and the metaphysis, sparing the epiphysis 75% incidence
- ▣ Type III – A fracture through growth plate and epiphysis, sparing the metaphysis 8%
- ▣ Type IV – A fracture through all three elements of the bone, the growth plate, metaphysis, and epiphysis 10%
- ▣ Type V – A compression fracture of the growth plate (resulting in a decrease in the perceived space between the epiphysis and diaphysis on x-ray) 1%

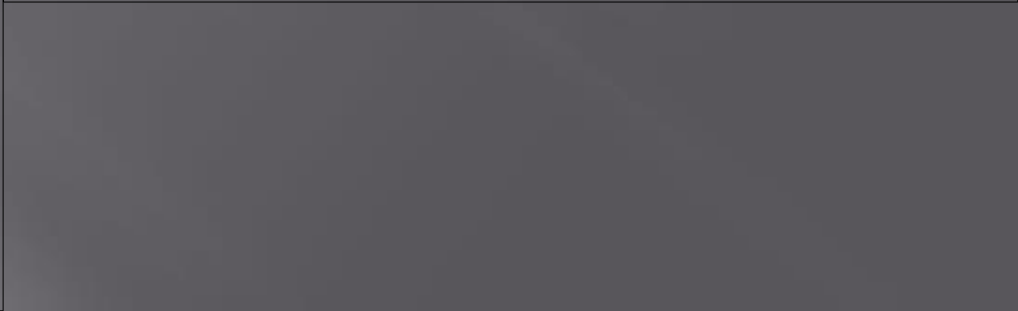
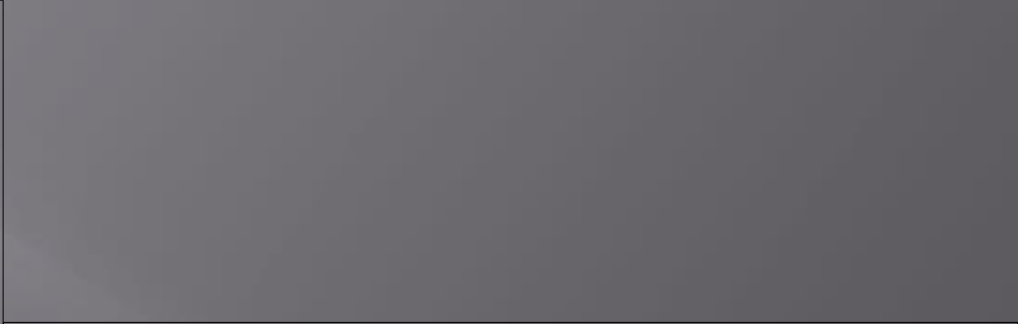




# Hand Fracture Indication for Fixation Non- Articular #

- ▣ Angulation
- ▣ Rotation
- ▣ Shortening

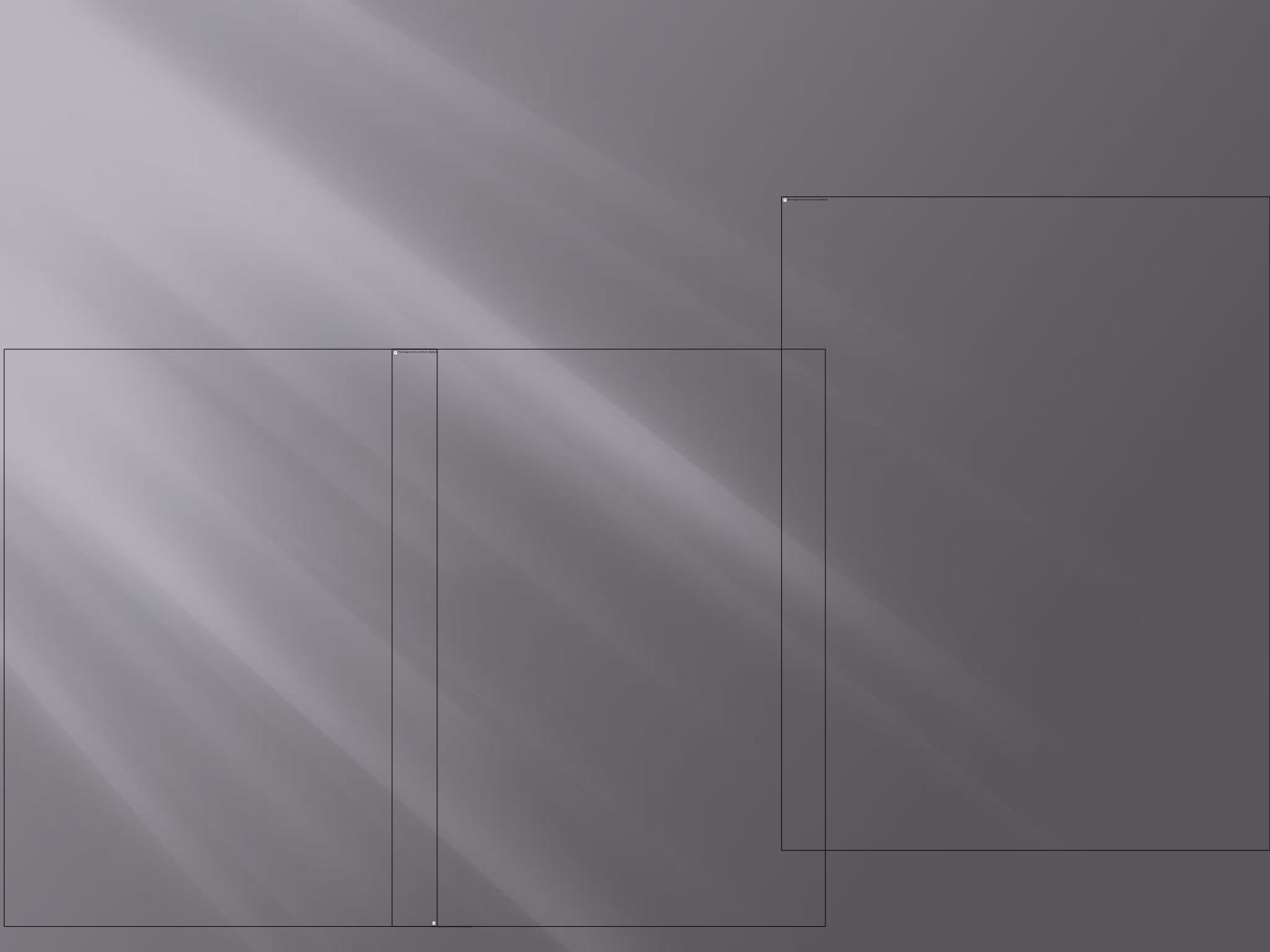


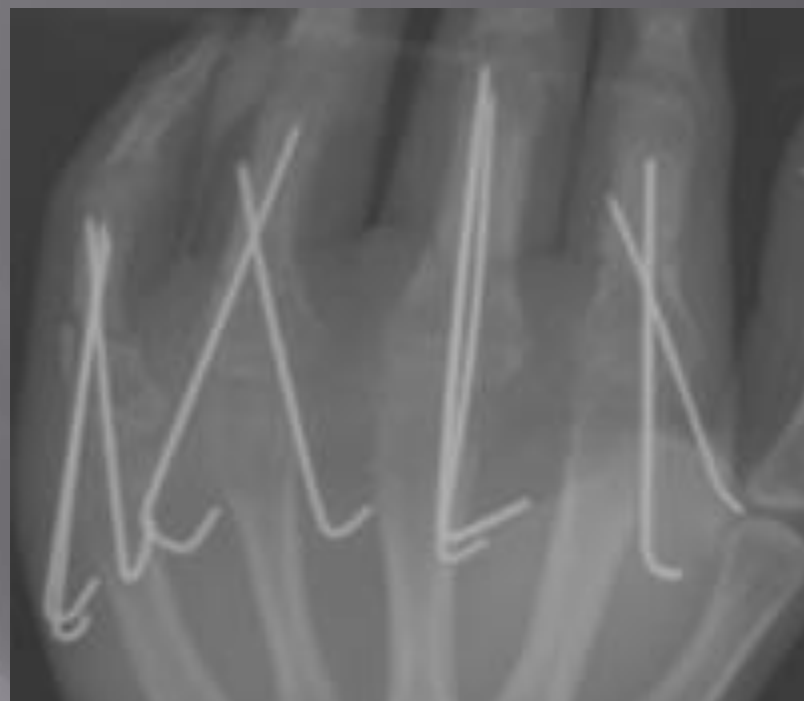


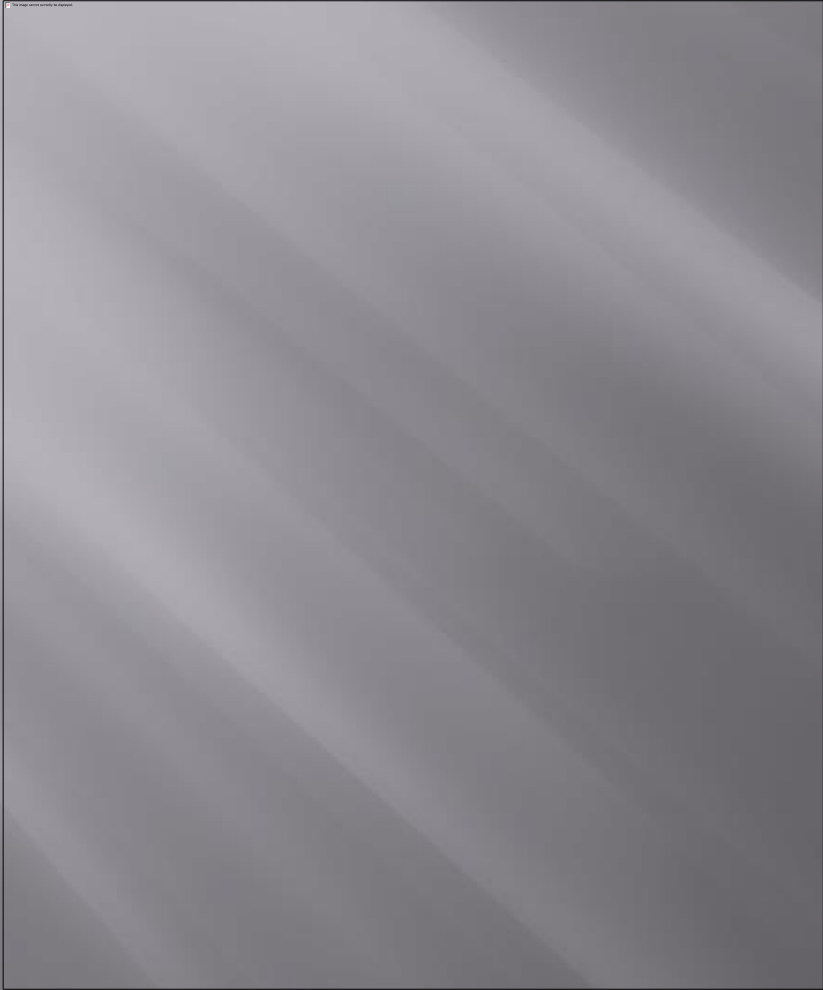
# Hand Fracture Technique of Fixation

- ▣ Close reduction splint
- ▣ Close reduction K-Wire fixation
- ▣ ORIF
  - Lag Screw
  - Plate
  - Circulage wire









# Carpal Tunnel Syndrome Incidence

- ▣ The most common nerve compression in the upper limb 1 – 10% of the population
- ▣ ? As high as 60% in people with repetitive hand movement
- ▣ Anatomy
  - Base is the bony carpal arch
  - Bridge is the flexor retinaculum
  - Has 9 flexor tendons and the median nerve

# Carpal Tunnel Syndrome

## Aetiology

- ▣ Due to increase volume of the content or reduction of the tunnel size
  - Acromegaly
  - Trauma
  - OA
  - Ganglion, Lipoma
  - Inflammation Tenosynovitis, gout
  - DM, Thyrotoxicosis, Pregnancy
  - Congenital :
    - ▣ Abnormal muscle, Persistent median artery



# Carpal Tunnel Syndrome Symptoms

- ▣ Pain
- ▣ Numbness
- ▣ Paraesthesia in the median nerve distribution
  - Radial 3.5 digits
- ▣ Night pain
- ▣ Pain radiate proximally to the shoulder
- ▣ Weakness
- ▣ Clumsiness

# Carpal Tunnel Syndrome

## Clinical Features

- ▣ Weakness, & wasting of the hand thenar muscles
- ▣ Altered sensation in the median nerve distributions
- ▣ Positive Tinel's sign
- ▣ Positive Phalanx test
- ▣ Reverse phalanx test

# Carpal Tunnel Syndrome Investigations

- ▣ X-Ray
- ▣ CT scan
- ▣ MRI
- ▣ Nerve conduction studies

# Carpal Tunnel Syndrome Treatment

## ▣ Non-Operative

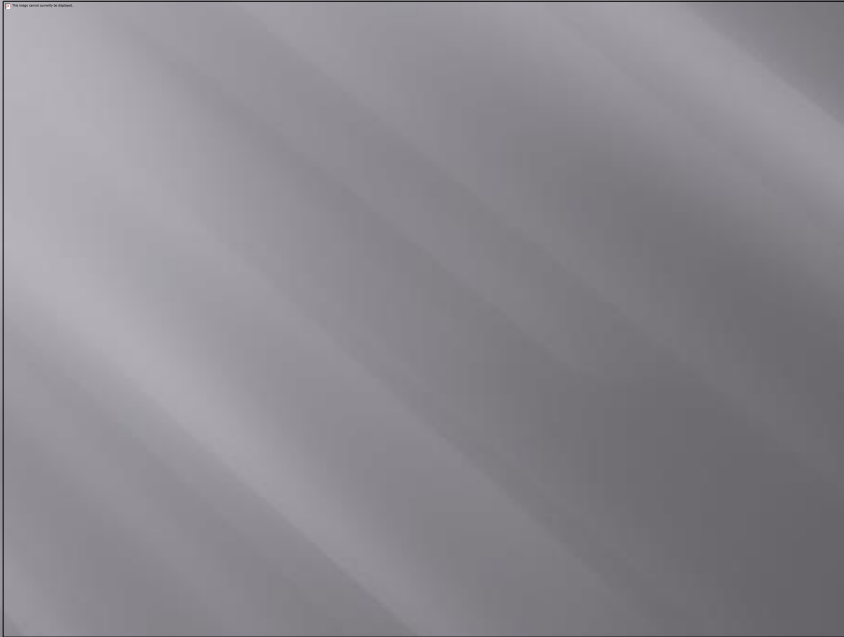
- Splint
- NSAID's
- Steroid Injections

## ▣ Operative

- All Open technique
- Limited incision Technique
- Endoscopic Techniques

# Carpal Tunnel Syndrome

## Open Release





# Carpal Tunnel Syndrome Open Release



# Carpal Tunnel Syndrome

## Open Release

